Int. J. Salt Lake Res. **1**(2) (1992) 1–8

The Dead Sea monster

Arie Nissenbaum

The Weizmann Institute of Science, Rehovot 76100, Israel.

Key Words: Dead Sea, *Echis colorata*, Jordan Valley

Abstract

For a very large part of human history, the Dead Sea has been considered a prime example of an environment completely devoid of life, a condition which during the Greco-Roman period was ascribed to natural causes–the bitterness of the water and the hydrogen sulphide stench associated with the area. In the Middle Ages, however, attitudes towards the Dead Sea changed and it came to be considered satanic, actively hostile to anything with the breath of life in it. During this time, two types of Dead Sea monsters are described in various sources: One type is truly halophilic monsters that lurk in the lake itself and are responsible for the drowning of believers who immerse themselves at the baptismal site in the Jordan River, not far from the Dead Sea; the other, based on several descriptions written between the 12th and 15th centuries, is of a serpent named Tyr or Tyrus which lives near the Dead Sea, and which has several mythical properties. It is extremely poisonous and when it stings a horse its rider dies too; it can glow like a red-hot iron and can pierce thick wooden boards. The inhabitants occasionally catch it, and its poison is used as one of the ingredients in preparing tyriac—a universal panacea against poisons and a much sought after drug from the first century BC to the 17th century AD. There is little doubt that descriptions of the mini-monster Tyr are based on Echis colorata, *a poisonous snake found in the Jordan Valley, near the Dead Sea, whose bite has been fatal in several cases.*

Introduction

The para-biology of the lacustrine environment is a field of research that has not been studied in great detail. A glaring exception is Nessie (*Nessisteras rhombopteryx*; Scott and Rines, 1975), the monster of Loch

Ness, Scotland, which has been the subject of many expeditions and eyewitness reports. With regard to the latter, it may be worth noting the abundance of distilleries in the neighbourhood of Loch Ness. This may have been a contributing factor. From time to time, however, reports have surfaced on the occurrence of unusual life forms in other aquatic environments. The Aral Sea in Kazakhstan appears to have its own indigenous monster and there have been reports of strange malevolent creatures in the swamps of West Africa (Heuvelmans, 1965).

No report, as far as is known to the present author, was ever made on an hypersaline or halophilic monster. Thus, to the small menagerie of freshwater and brackish lacustrine monsters we can now add an hypersaline monster, Tyr of the Dead Sea.

Life in the Dead Sea

For a very large part of human history, the Dead Sea has been considered a prime example of an environment which is not only completely devoid of life but one which is actually actively hostile to anything with the spark of vitality in it (Nissenbaum, 1979). This attitude toward the Dead Sea has undergone several changes through the centuries. The earliest report on the sterility of the Dead Sea can be found in Aristotle's (384–322 BC) *Meteorologica* in which he wrote that Dead Sea waters are so bitter that no fish could live there. This rationalistic approach, typical of the Greco-Roman period, attributed the barrenness of the Dead Sea to natural causes—the bitterness of the water, the high salt content, and the noxious stench emanating from it. This offensive odour is caused by the presence of hydrogen sulphide in the saline springs abundant along the shores of the Dead Sea and perhaps also by the hydrogen sulphide present in the lower water mass of the stratified Dead Sea prior to the overturn of the lake in 1979 (Steinhorn *et al.*, 1979; Nissenbaum and Kaplan, 1975). Among the illustrious historians and geographers who followed this realistic approach are Josephus Flavius, Strabo, and Diodorus of Sicily in the first century AD and Galen and Pausanias in the second century AD (Nissenbaum, 1979).

With the collapse of the Roman Empire and the triumph of Christianity in the early Middle Ages, the Dead Sea area became a favourite site of retreat for numerous hermits, mystics and visionaries, and the region became shrouded in mystery and superstition. Those travellers who managed to reach the Dead Sea, and there were not too many, were usually pilgrims who came to see holy sights and their reports are a strange combination of fact and fiction, with the latter usually

dominant. A major attraction for those pilgrimages were the cities of Sodom and Gomorrah whose ruins were said to lie either on the shores of the lake or submerged under its waters.

This association with crime, sin and divine punishment converted the Dead Sea in the Middle Ages into a satanic region, perhaps even to the ingress to the environs of hell (Nissenbaum, 1979). This superstition, in turn, resulted in the belief that the Dead Sea, as a fief of the devil, was inimical to any life forms. Yet, in an apparent paradox, some reached the strange conclusion that 'if one by any means immerses a living creature in it the living matter immediately leaps out' (Roger of Tillbury, twelfth century). G. Giraudet, a sixteenth century French priest, claims that criminals have been kept in Dead Sea water for three or four days and did not drown (White, 1920).

Towards the end of the eighteenth century, travellers to the Holy Land became interested in the unique properties of the lake, and in 1786 the first modern chemical analysis of Dead Sea water was performed by Lavoisier and co-workers, to be followed by further analyses by some of the world's leading chemists (Nissenbaum, 1970, 1986). The advent of environmental microbiology, mostly by microscopy, led to fruitless searches for microorganisms in the Dead Sea, beginning with Gay-Lussac in 1819 (Nissenbaum, 1979). Although there were some vague reports of the existence of higher organisms, such as infusoria or corals, living in the Dead Sea, those reports were discredited and by the second half of the nineteenth century it was accepted that macro- or microorganisms do not exist in the lake (Nissenbaum, 1979). Thus, the Dead Sea was considered to be an environment—perhaps the only one of its kind on the surface of earth—totally and completely devoid of life.

This notion was shattered by the studies of Elazary-Volcani (1940; Volcani, 1944) who isolated a single species of green algae and three types of bacteria from the waters of the Dead Sea and its sediments. Since then, research has been carried out on some of the ecological, physiological and taxonomical properties of organisms from the Dead Sea (see reviews by Nissenbaum, 1975; Oren, 1988), although much more remains to be done.

Certainly, the Dead Sea itself does not present a hospitable environment for monsters. For example, with the specific density of Dead Sea brine being 1.235, it would require a monster of unusually high density to be able to dive below the surface. Even monsters have to eat, and presumably much. With the paucity of life forms and the extremely depleted biomass in the Dead Sea brine, how then could even a small monster survive? All hope is, however, not lost. If monsters cannot exist in the water of the lake, perhaps they can on its shores.

The Dead Sea monster(s)

The major source of information on monsters from the Dead Sea environs is the travel book by Felix Fabri who visited the Holy Land in between 1480 and 1483 AD. Fabri was a Swiss-born Dominican priest whose *Evagatorium* is perhaps the fifteenth century's best-known Holy Land travel book (Fabri, 1893).

During the Middle Ages many pilgrimages to the baptismal place in the lower Jordan River encountered great difficulties. Fabri writes in his travelogue: 'I have enquired of pilgrims who have been to the Jordan before me and after me and have found that some trouble always befell somebody'. Since, as Fabri writes, the Jordan river is neither a fast flowing river nor is it wide, the question remains as to what is the source for such calamity?

Several explanations were proposed by Fabri. Among them is this one: Since the baptismal place is not far from the Dead Sea, a certain amount of the brine is introduced into the lowermost reaches of the Jordan River. Since the brine is venomous, this results in many mishaps to the pilgrims. Others say that the act of swimming in the Jordan smacks of wantonness and dissoluteness, and that the Lord punishes such sacrilegous behaviour. Another possible reason is psychological: because people expect trouble, they swim across the Jordan in a state of terror and 'some of them on the strength of their imagination believe themselves to be touched or drawn under'. Another explanation is more zoological in nature, and concerns the Dead Sea monster. Fabri writes that people believe that nothing can live in the Dead Sea, save certain unnatural and hellish beasts, who swim up from the Dead Sea to bring men to their doom.

In addition to the speculation on aquatic Dead Sea monsters, Fabri (1893) devotes lengthy paragraphs to another amazing and monstrous animal. On the coast of the Dead Sea lives 'a most venomous but most noble serpent, the Tyr'. This serpent is not found anywhere else in the world and it produces a most powerful and precious drug—the so-called tyriac—the only true tyriac in the world. The name tyriac is derived from the Greek *tyriacos*, a drug against venomous bites which can act as antidote against the bite of any snake, except Tyr itself (Bodenheimer, 1956).

Tyriac, also known as theriac, theriaque, thiriaca, teriaca, tariyak and treacle—among other names—was developed by the physician Andromachus of Crete, personal physician to Emperor Nero (first century AD; see Major, 1954). Actually, theriac was supposed to have been discovered by Nicander of Colophon in the second century BC. This drug was supposed to have been first developed by King Mithridates IV of

Pontus (in present-day Turkey). Andromachos added to it the component of viper troches, and since then it was frequently known as theriaca andromachi although the name mithridatum was also in use (Paulshock, 1982). Originally recommended as a remedy against snake bite, it became a universal panacea against all kinds of poisoning and every kind of disease. Ultimately, the final prescription comprised sixty-four ingredients—among them animal-, vegetable- and mineral-derived materials including opium and troches of viper. This intriguing concoction, mixed with old wine and honey (Paulschock, 1982 and references therein), continued to be an important component of the European pharmacopoeia until at least the eighteenth century.

According to Fabri (1893), Tyr is essentially a mini-monster, about half an ell long (*ca.* 50 cm). Though itself only the thickness of a thumb, it is strong enough to pierce a board three fingers thick. It is yellow with tinges of red in colour and is characterised by terrible rages. When angry it flashes a fiery tongue, whirls around very fast and its body glows like red-hot iron. Its head, which is usually small, changes during such fits of rage, and it swells until it is bigger than its body and it glides along with a dreadful hiss. Its poison causes the body to swell and burst and there is no remedy against its bite unless one amputates the bitten organ. Its face has bristles like a boar and it is eyeless, which is fortunate for the residents of the region, otherwise no man could approach him, because it is so cunning and its poison is so strong that when it bites a horse, its rider also takes the poison and dies. This monster, however, together with the balsam that grew in the oases near the Lake constituted a precious natural resource of the barren Dead Sea area (Nissenbaum, 1992). It was so valuable that the soldan (= sultan) forbade any strangers from going to the area to collect the tyriac. The monopoly on the export of this material to Egypt is reserved for the sultan. However, as has been proven time and again, royal or state monopolies are hard to impose, and the poor inhabitants often broke the law and sold the serpents to Christian merchants throughout the Middle East–in Beirut, Damascus, Alexandria and Cairo.

The tyriac is produced in the following manner. The crafty serpent is caught alive and put in a large basin. While attempting escape, it is provoked by being poked with sticks and needles. As its anger mounts up, the poison, originally evenly distributed through its body, becomes concentrated in its head and tail, and with a stroke of a sharp knife or razor, these extremities are cut off. The poison is then sold for a high price, exceeding that of gold or precious stones. Thus the tyriac together with the balsam perhaps made up the most important contribution to the coffers of the sultan of Egypt.

Fabri's description is only one of several descriptions of terrible Tyr, the others being somewhat less detailed. Perhaps the earliest description is by Jacques de Vitry (*ca.* 1165–1260 AD), Bishop of Acre and Patriarch of Jerusalem during the Crusader period. According to de Vitry, the flesh of Tyr together with other ingredients was used for the preparation of theriac. This agrees with the report by Mukaddasi, the Arab geographer writing in 985 AD (Mukadassi, 1896), that the serpent 'tariyakkiyah' can be found near Jericho and that out of its flesh the excellent Tariyak of Jerusalem—an antidote againt poisoning which is considered to be without equal—can be made. It is interesting to note that no supernatural elements are involved in Mukadassi's description.

Ernoul, in 1231 (Ernoul, 1896), describes a field near Jericho where snakes are abundant. The snake Tyrus, which is found there, is caught by people circulating around the field chanting incantations. On hearing the chants, the serpents approach the people and are easily caught, almost like lambs. After capture, the snakes are sold to urban druggists, expert in the manufacture of theriac, who produce this all-effective antidote against any poison. Some of the serpents, however, evade capture by closing their ears, putting one to the ground and sealing the other by their tail.

Three Italians from Milan, Frescobaldi, Gucci and Sigoli, who visited the Holy Land in 1384, described the ruins of Jericho (Frescobaldi *et al.*, 1948). According to their travelogue, the reptile turcisci is found between crevices of the remaining walls and foundations, and from this reptile treacle is made. According to these travellers, treacle would be useless without those poisonous reptiles. Although the turcisci is very probably identical with the serpent Tyr, those travellers describes it as a lizard-like creature rather than a snake.

Rudolph von Suchem, who wrote his travel book in 1350 (von Suchem, 1895), maintained that the serpent Tyrus could be found in the Dead Sea area. His description matches almost word for word that of Fabri, causing one to wonder if Fabri's description can be viewed as an independent source. The one minor embellishment in von Suchem's report is the description of how the snake Tyr, in a moment of anger 'puts out a tongue like a flame of fire and one would think that it was fire indeed, save that it does not burn the creature; it sets up the hair in its face like a boar, and its head grows three times larger' (von Suchem, 1895). Several other descriptions, such as those by Bernard von Breydenbach and by von Harff, both in the fifteenth century, repeat the general description without adding new details. One of the latest mentions of Tyr and tyriac is by Francesco Suriano (Suriano, 1983) who visited the Holy Land in 1516 and reported that out of the Dead Sea comes the Tyro, a medicinal animal worth over 200 ducats.

The real creature behind the monster

While the real nature of the monsters that Fabri mentions as living in the depths of the Dead Sea are an enigma, there can be no doubt as to the story of Tyr, the amazing serpent. One of the most common poisonous snakes in the area between the Nile River and the Arabian Desert is *Echis coloratus* (Arbel, 1984). This snake, yellowish to reddish-brown in colour, is characterized by a large head, thicker than its neck. When defending itself, it twists and turns rapidly, emitting strong sound by rubbing its scales. Its poison is very potent; Arbel (1984) writes that in 1918, three soldiers were bitten by one snake and died. This happened in the Jordan Valley, just north of the Dead Sea, the district in which the mythical Tyr resides. *Echis coloratus* can grow up to 80 cm in length, although it is usually somewhat shorter. Fabri gives its size as half an ell. A Swiss elle is 60 cm and a Netherlands ell is about 1 m and thus Fabr's report is not that far removed from the truth.

Acknowledgments

Professor J.R. Gat and Mrs R. Friesem (Weizmann Institute) are warmly thanked for reading and commenting on the manuscript.

References

Arbel, A., 1984. **Plants and Animals of the Land of Israel.** Vol. 5. **Snakes and Amphibians.** 244 pp. Ministry of Science Pub., Tel Aviv.

Bodenheimer, F.S., 1956. **[Animal Life in Biblical Lands.]** Vol. 2. 403 pp. Bialik Institute, Jerusalem. [In Hebrew]

Elazari-Volcani, B., 1940. [Studies on the Microflora of the Dead Sea.] Ph.D. Thesis, Hebrew University of Jerusalem. [In Hebrew]

Ernoul, 1896. **The City of Jerusalem.** Trans. R.C. Conder. Vol. 6. 69 pp. Palestine Pilgrims Text Society, London.

Fabri, F. 1893. **The Book of Wandering of Felix Fabri *ca.* 1480–1483 AD.** Trans. A. Stewart. Vol. 10. 676 pp. Palestine Pilgrims Text Society, London.

Frescobaldi, Gucci and Sigoli, 1948. **Visit to the Holy Places of Egypt, Sinai, Palestine and Syria in 1384.** Trans. T. Bellorini and E. Hoade. 42 pp. Franciscan Press, Jerusalem.

Heuvelmans, B., 1965. **On the Track of Unknown Animals.** 332 pp. Paladin, London.

Major, R.H., 1954. **History of Medicine.** Charles Thomas Pub., Springfield, Ohio.

Mukadassi., 1896. **Description of Syria (including Palestine).** Trans. G. LeStrange. Vol. 3. 101 pp. Palestine Pilgrims Text Society, London.

Nissenbaum, A., 1975. The microbiology and biogeochemistry of the Dead Sea. *Microbial Ecology* **2**: 139–161.

Nissenbaum, A., 1970. Chemical analyses of Dead Sea and Jordan River Water, 1778–1830. *Israel Journal of Earth Sciences* **8**: 281–286.

Nissenbaum, A., 1977. Physicochemical basis of legends of the Dead Sea. In: D.C. Greer (Ed.) **Desertic Terminal Lakes.** pp. 159–168. Utah Water Resources Laboratory, Logan, Utah.

Nissenbaum, A., 1979. Life in the Dead Sea: Fables, allegories and scientific search. *BioScience* **29**: 153–157.

Nissenbaum, A., 1986. Chemical analyses of Dead Sea water in the 18th Century. *Journal of Chemical Education* **63**: 297–300.

Nissenbaum, A., In press. The Dead Sea—An economic resource for 10,000 Years. *Hydrobiologia*.

Nissenbaum, A., and Kaplan, I.R., 1975. Sulfur and carbon isotopic evidence for biogeochemical processes the Dead Sea. In: J.O. Nriagu (Ed.) **Environmental Biogeochemistry.** pp. 309–325. Ann Arbor Sci. Pub., Ann Arbor, Michigan.

Oren, A., 1988. The microbial ecology of the Dead Sea. In: K.C. Marshall (Ed.) **Advances in Microbial Ecology.** pp. 193–229. Plenum, N.Y.

Paulschock, B.Z., 1982. William Heberden, M.D. and the end of Theriac. *New York Journal of Medicine* **82**: 1612–1615.

Scott, P., and Rines, R., 1975. Naming the Loch Ness Monster. *Nature, London* **256**: 466–468.

Steinhorn, I., Assaf, G., Gat, J.R., Nishri, A., Nissenbaum, A., Stiller, M., Beyth, M., 1979. The Dead Sea: Deepening of the mixolimnion signifies the overture to overturn of the Dead Sea. *Science* **206**: 55–57.

Suriano, F., 1949. **Treatise on the Holy Land.** Trans. T. Bellorini and E. Hoade. 255 pp. Franciscan Press, Jerusalem.

Volcani, B.E., 1944. The microorganisms of the Dead Sea. In: **C. Weizmann Collective Volume.** pp. 71–85. Daniel Sieff Research Institute, Rehovot.

von Suchem, R., 1895. **Description of the Holy Land.** Trans. A. Stewart. Vol. 12. 136 pp. Palestine Pilgrims Text Society, London.

White, E.D., 1920. **History of Warfare of Science and Technology with Theology in Christendom.** Reprinted 1965 Ed. Dover, New York.